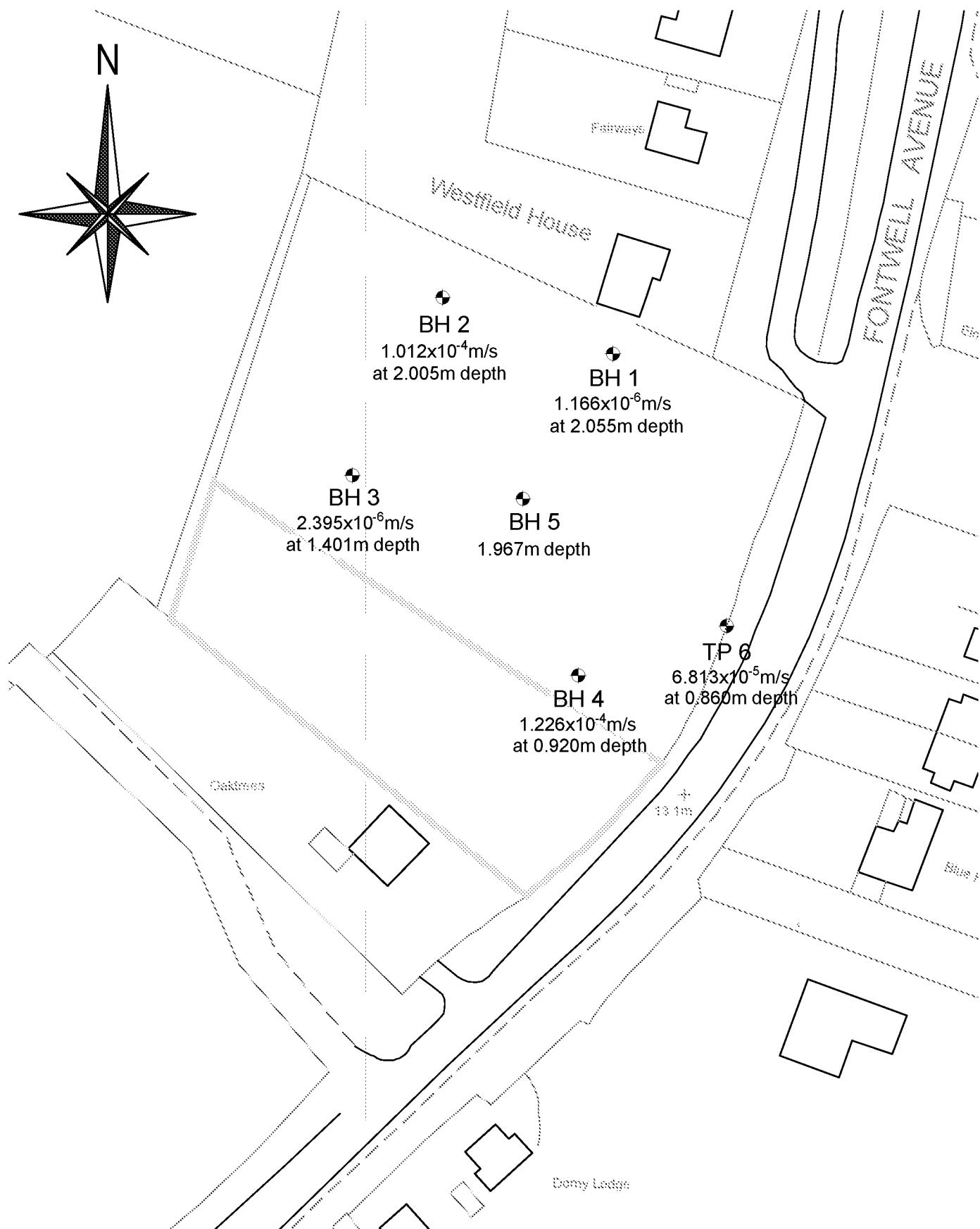
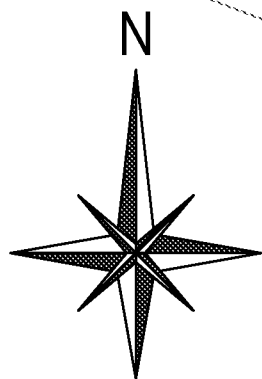




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Client David Parker					
Project Land at Fontwell Avenue					
-	Original	PC	RTFC	16.10.21	
Rev.	Description	App.	Chk.	Dm.	Date

Title Lowest Results from Percolation Testing		
Scale 1:1250	At original A4	© Robert Clark Associates Ltd
Drawing Number 2112/P2	Revision -	

Surface Water Drainage Design Notes

Soil investigations were done for the discharge of Planning Condition #4 applied to Plot#3 (north) and for any possible planning condition to be applied to Plot#2 (central), however Plot#1 (south) was always borne in mind.

The geology as detailed from the BGS is superficial deposits of Head - Gravel Sand Silt and Clay, overlying bedrock of the London Clay Formation - Clay Silt and Sand. It was considered that the London Clay Formation was not encountered during investigations.

It was decided to perform provisional preliminary testing in augered boreholes of 170mm diameter, to BRE365 Principles, so as to inform as to the overall ground conditions, and thus finalise testing within BRE365 Trial Pits, as to location and depths. A general spread of provisional test locations was proposed.

The location of boreholes BH#1 to BH#5 are shown on the attached plan. This also details the depths of the boreholes for testing and the minimum rates obtained from the testing. It should be noted that no tests were performed in borehole BH#5 since its soils extracted were very similar to that within borehole BH#2 as to type of soils and respective depths. All testing occurred in late March to very early April 2017.

Boreholes BH#1 and BH#4 subsequently had Groundwater Monitoring pipes installed, at BH#1 the maximum depth was slightly increased to 2205mm below ground level (BGL) and BH#4 was extended to 1994mm BGL, to perform a groundwater monitoring exercise. During the monitoring period of late March to late April 2017 the maximum levels of groundwater recorded were :-

- a) GWP#1 within BH#1 at 2179mm BGL on 31st March 2017
- b) GWP#2 within BH#4 at 1900mm BGL on 31st March 2017

It was considered that, due ground topography, all rainwater from impermeable roof areas would have to be drained to the front of the buildings (east).

It was also considered that due to the large variations of the Soil Infiltration Rates obtained (by two orders of magnitude), a prudent drainage solution would be to drain to Permeable Paving, thus utilising its storage capacity, with initial points of infiltration into Concrete Ring structures. This would integrate the variations of soil infiltration rates, over a considerably larger surface area, than just that at single point structures. In addition the proposed access / entrance roads and any parking / hardstanding areas would have to be permeable in their own right. This would provide a consistent drainage solution across the whole site.

To that end final testing for the proposed permeable paving was performed within a BRE365 Trial Pit of dimensions 1100mm long x 450mm wide x 860mm deep at location TP#6 in the main area of the proposed permeable paving.

The Soil Infiltration Rate used in the design was 5.633 E-05 metres / second. This rate was an interpretation using the lowest rates obtained from each test.

For Plot #1 (south)

The rate used in the calculation was this rate of 5.633 E-05 metres / second, which was the rate used in the approved calculations for the discharge of conditions of Plot#3 (north). This rate was also that which was agreed with Arun DC drainage engineers for use within the design. The calculations produced a hydraulic storage depth of 130mm for the coarse grade aggregate (CGA). It should be noted that the minimum depth of CGA for structural design purposes is 275mm.

As requested by Arun DC drainage engineers, a quick redesign was undertaken using the slowest rate of 1.166 E-06 metres / second, to understand the impact on the resultant depth of CGA. This proved to be a hydraulic storage depth of 445mm. A second redesign exercise using an artificial slower rate of 1.000 E-05 metres / second produced a hydraulic storage depth of CGA of 263mm -- still less than the minimum required for structural purposes. This information has already been forwarded to Arun DC drainage engineers.

It should be noted that the test location closest to the proposed storage and infiltration permeable paving structure, BH#4, produced a minimum Soil Infiltration Rates of 1.226 E-04 metres / second at 920mm deep, whereas the lowest recorded Soil Infiltration Rate of 1.166 E-06 metres / second at 2055mm deep was within BH#1 -- the furthest from the proposed permeable paving structure. The nearby BRE365 Trial Pit TP#6 produced a minimum Soil Infiltration Rate of 6.813 E-05 metres / second at 860mm deep.

RC

18th October 2021